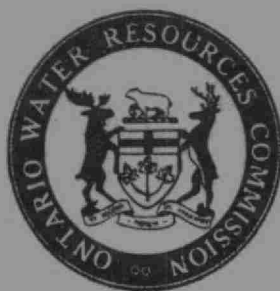


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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

COMMUNITY OF HORNEPAYNE

TOWNSHIP OF WICKSTEED

1966

COMMUNITY OF HORNEPAYNE - 1966
TOWNSHIP OF WICKSTEED

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1966

Report on a water pollution
survey of the community of
Hornepayne, township of
Wicksteed, district of Algoma.

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R E P O R T

on a

WATER POLLUTION SURVEY

of the

COMMUNITY OF HORNEPAYNE

TOWNSHIP OF WICKSTEED

District of Algoma

April, 1966

Division of Sanitary Engineering

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R E P O R T

ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

A water pollution survey was made in the Community of Hornepayne on September 15, 1965. The purpose of the survey was to locate and record all significant sources of water pollution within the townsite. Such surveys are performed routinely, and upon request, by the Ontario Water Resources Commission as a basis for evaluating all existing and potential sources of pollution. When sources of pollution are found corrective action is requested by the Commission. Where water and/or pollution control works appear desirable or expansions to present facilities are necessary, the Commission has a programme to aid in the construction and financing of these works.

The information received from Reverend Patrick Atkinson and Mr.M.W. Tompkins, Clerk-Treasurer, is gratefully acknowledged.

I GENERAL INFORMATION

The Community of Hornepayne is located in the Township of Wicksteed in the District of Algoma. The Township of Wicksteed had a 1964 population of 1,848 (1965 Municipal Directory) with the main urbanization in the Community of Hornepayne. Hornepayne, covering an area of 576 acres, is a Canadian National Railways divisional point and is located 83 miles by road from Hearst on Highway No. 11 and No. 631.

Drainage for Hornepayne is provided by Jackfish Creek which meanders from north to south on the easterly limits of the community. The ground gradually rises to the west from the flood plain of Jackfish Creek. Outcroppings of rock formation are predominant in the northerly section where a large rock ridge is located. The soil consists mostly of clay with deposits of sand and gravel spotted throughout the area.

The majority of the work force in Hornepayne is employed by the Canadian National Railways. During the summer months tourists enjoy the fishing, hunting, and camping facilities available in the township.

II WATER USES

1. Municipal Water System

Approximately 266 residences or a population of 1,100 are served by the municipal water system. The water source is an infiltration well located in the railroad ballast pit near Jackfish Creek. Water is chlorinated prior to being pumped to the distribution system. A 25,000 gallon elevated storage tank is included in the system. The bacteriological quality of the water was satisfactory at the time of the last OWRC inspection.

The existing distribution system consists of undersized piping, laid at a shallow depth and prone to freeze-up and breakage. In the fringe areas of the system, poor capacity and pressure problems occur. Turbid water conditions have been experienced at dead ends

where flushing cannot be implemented.

A Preliminary Engineering Report has been prepared by R.K. Kilborn and Associates, Consulting Engineers, for a water distribution system. Included in the project is the construction of a new 100,000 gallon standpipe and extensive improvement to the present distribution system. The proposed project will also have 206 new services. The proposed water works extensions should improve water pressure and provide better fire protection and should allow for main flushing programmes relieving the turbid water conditions.

The Commission's final certificate of approval (#65-B-491) for the construction of a water distribution system has been forwarded to the Township of Wicksteed.

2. Private Water Systems

The remaining populace relies on privately-owned drilled and dug wells. However, Jackfish Creek is also used as a water supply by the Indians residing in the outskirts of town and residents within the town.

3. Recreational

Jackfish Creek is used primarily for fishing; however, swimming does occur within the vicinity of the town. Other surface waters within the township are used for swimming, fishing and boating.

III WATER POLLUTION

1. Sanitary Waste Disposal

A municipal sewage disposal system is not provided in

Hornepayne. Residences and commercial businesses within the community are serviced by septic-tank and subsurface tile-bed systems. Private privies are also utilized within the community. The area in which the Indians live is served by private privies with possible pail-a-day methods.

Many of the sewage disposal systems drain either directly or indirectly to roadside ditches. Many of the tile beds are inadequate due to the small lot sizes. Also the problem of subsurface disposal is aggravated by the soil conditions consisting of shallow soil over bedrock.

Drainage is provided by open ditches which eventually discharge to Jackfish Creek. A storm sewer is located between Third and Fourth streets and discharges to the creek beyond the British American Oil Company property.

2. Refuse Disposal

The municipal refuse disposal site is located approximately one-half mile east of the Community of Hornepayne. The municipality provides weekly collection of refuse and garbage. It is a burn and cover type of dump. The site did not appear to constitute a water pollution problem.

3. Industrial Waste Disposal

Canadian National Railways - The Canadian National Railway yard is located adjacent to and west of Jackfish Creek in the northern section of Hornepayne. Operations, in which oil is used,

consist of oiling box-car journals and refueling diesel locomotives. At the time of the inspection, oil was observed on the water surface of Jackfish Creek downstream and adjacent to the Canadian National yard. The oil was suspected to be emanating from Canadian National yard. It is probable that with any precipitation the oil would be carried to the creek. It was also reported that oil was gaining access to Jackfish Creek because of pipe leakages occurring in the yard.

4. Discussion of Sample Analyses

The laboratory results of the bacteriological examinations and the chemical analyses of samples collected from the watercourses and outfalls are included in the tables appended to this report. Descriptions of the tests and an outline of the OWRC objectives are also included.

Generally, the water samples collected from the open ditches in the community revealed total coliform counts in excess of the Commission's maximum objective of not greater than 2,400 coliform organisms per 100 c.c. Also, the 5-Day BOD of the samples were in excess of the Commission's objective of 4.0 ppm.

The coliform counts, indicative of fecal pollution, were probably caused by the drainage from private sewage disposal systems of which many of the septic-tank systems were malfunctioning. Due to the shallow overburden and small lot sizes, these septic-tank systems discharge effluent directly to the roadside ditches.

The water samples were collected following a snow and rain fall; consequently, the ditches contained considerable surface runoff. With the excess of storm water in the open ditches, the coliform counts obtained at this time would be somewhat less than counts ordinarily obtained during dry weather conditions.

A sample, collected from the storm sewer discharging to Jackfish Creek east of the British American Oil Company property, revealed a 5-Day BOD and suspended solids concentration in excess of the Commission's maximum objectives of 15 ppm for both parameters. The bacteriological examination of the sample revealed excessive fecal pollution which gains access to the storm sewer via connections from septic-tank systems and open ditches.

Water samples collected from Jackfish Creek downstream from Hornepayne revealed total coliform counts in excess of the Commission's maximum objective of not greater than 2,400 coliform organisms per 100 c.c. Samples collected upstream from Hornepayne showed that the bacteriological quality of the water was within the Commission's objective.

Macroscopic inspection of Jackfish Creek revealed that oil pollution is prevalent with considerable amount of oil emanating from the Canadian National Railway yard. A sample collected from a drainage ditch discharging from the yard to the creek revealed a total coliform count in excess of the Commission's objective. Also, it was observed that an excessive amount of oil was discharging

from this ditch.

Oil pollution is indicated by the ether solubles obtained in the laboratory results.

As revealed by the sample results, the water quality of Jackfish Creek has been adversely affected by the presence of oil and fecal matter.

IV SUMMARY AND CONCLUSIONS

A municipal water pollution survey was undertaken in the Community of Hornepayne on September 15, 1965.

Hornepayne has a communal water works serving approximately 266 residences. The remaining populace relies on private well supplies and Jackfish Creek.

The importance of instituting the water works project to improve the present distribution system and extending it to areas served by private well supplies and Jackfish Creek is revealed by the results of the laboratory examinations which indicated that the creek was contaminated with fecal matter.

Fecal pollution of Jackfish Creek is caused by the unsatisfactory sewage disposal methods practised in the community. Septic-tank systems are malfunctioning due to the general soil conditions resulting in septic effluent being discharged directly or indirectly to the open ditches which drain to Jackfish Creek.

The discharging of polluting wastes to a watercourse is prohibited by the Ontario Water Resources Commission Act and action

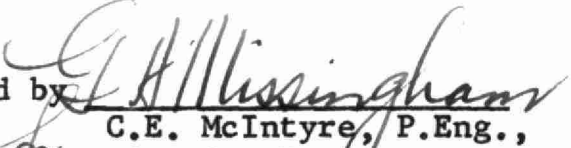
should be taken to correct this undesirable situation.

V RECOMMENDATIONS

1. The Indian settlement located to the east of Hornepayne should have access to a communal water supply.
2. The discharge of polluting wastes to open ditches and storm sewers should be eliminated.
3. The Canadian National Railways should inspect and correct any oil and fuel leakages occurring within the yard.
4. The Canadian National Railways should provide catch-basins at all refueling and oiling outlets to eliminate the discharge of oil onto the surface of the ground.

elc

Approved by


C.E. McIntyre, P.Eng.,
District Engineer,
Div. of Sanitary Engineering.

Prepared by: G.K. Boretski,
Engineer's Assistant.

APPENDIX

THE SIGNIFICANCE OF LABORATORY RESULTS

The OWRC objectives for surface waters in Ontario are as follows:

5-Day BOD - not greater than 4 ppm
Total Coliform organisms - not greater than 2,400 coliforms
per 100 c.c.

Phenolic Equivalents

Average - not greater than 2 ppb
Maximum - not greater than 5 ppb

pH - 6.7 to 8.5

Adequate protection for these waters, except in specific instances influenced by local conditions, should be provided if the following waste discharge concentrations are not exceeded:

5-Day BOD	- not greater than 15 ppm
Suspended Solids	- not greater than 15 ppm
Phenols	- not greater than 20 ppb
pH	- 5.5 to 10.6
Iron	- not greater than 15 ppm
Ether Solubles (oil)	- not greater than 15 ppm

EXPLANATION OF LABORATORY RESULTS

Bacteriological Examinations - The Most Probable Number Technique is used by the Ontario Department of Health to obtain an approximation of the actual number of coliform organisms present. These organisms are the normal inhabitants of the intestines of man and other warm-blooded animals. They are always present in large numbers in sewage and are, in general, relatively few in number in other stream pollutants.

Biochemical Oxygen Demand (BOD) - The biochemical oxygen demand test indicates the amount of oxygen required for stabilization of the decomposable organic matter found in sewage, sewage effluent, polluted waters, or industrial wastes, by aerobic biochemical action. The time and temperature used are five (5) days and 20°C respectively.

Solids - The analyses for solids include tests for total, suspended, and dissolved solids. Total solids is a measure of the solids in solution and in suspension. Suspended solids indicate the measure of undissolved solids of organic or inorganic nature whereas the dissolved solids are a measure of those solids in solution.

Phenolic Compounds - Phenols react with chlorine to produce intensely aromatic compounds. These compounds, even when highly diluted, may give a taste and odour to the water which is variously described as medicinal, chemical, or iodoform. Phenols taint fish and are toxic to fish, depending on the concentration. Normal water contains no phenolic compounds.

Oils and Ether Soluble Materials - These include oil and all other ether soluble materials such as tarry substances and greases. The presence of these pollutants renders water difficult and impractical to treat either for industrial or domestic use. Oils make streams unsightly and water unfit for bathing.

COMMUNITY OF HORNEPAYNE

TABLE I

OPEN DITCHES

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>MPN*</u> <u>Total Coliform</u> <u>Organisms/100 c.c.</u>	<u>E.coli</u> <u>per 100 c.c.</u>
SHJ-8.0 D-1	Open ditch south side of Sixth Ave.	Sept.15/65	125	810	138	672	0	0
SHJ-8.0 D-2	Open ditch on west side of First St.between Fourth and Fifth avenues.	Sept.15/65	14	404	31	373	24,000,000	24,000
SHJ-8.0 D-3	Open ditch south of public school.	Sept.15/65	2.0	472	9	463	930,000	24,000
SHJ-8.0 D-4	Open ditch east side of First St. between Third and Fourth avenues.	Sept.15/65	7.6	480	28	452	4,600,000	2,400,000
SHJ-8.0 D-5	Open ditch east side of Second St. between Third and Fourth avenues.	Sept.15/65	5.2	432	89	343	-	2,400,000
SHJ 8.0 D-6	Open ditch south east corner of Third Avenue and Third Street.	Sept.15/65	9.6	380	79	301	2,400,000	240,000

TABLE I (CONT'D)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids</u>		<u>Diss. (ppm)</u>	<u>MPN*</u>	
					<u>Susp. (ppm)</u>			<u>Total Coliform Organisms/100 c.c.</u>	<u>E.coli per 100 c.c.</u>
SHJ-8.0 D-7	Open ditch east side of Third St. between Third and Fourth avenues.	Sept.15/65	1.4	272	6		266	110	o

* Bacteriological examination performed at the Ontario Department of Health Regional Laboratory, Timmins, Ontario.

COMMUNITY OF HORNEPAYNE

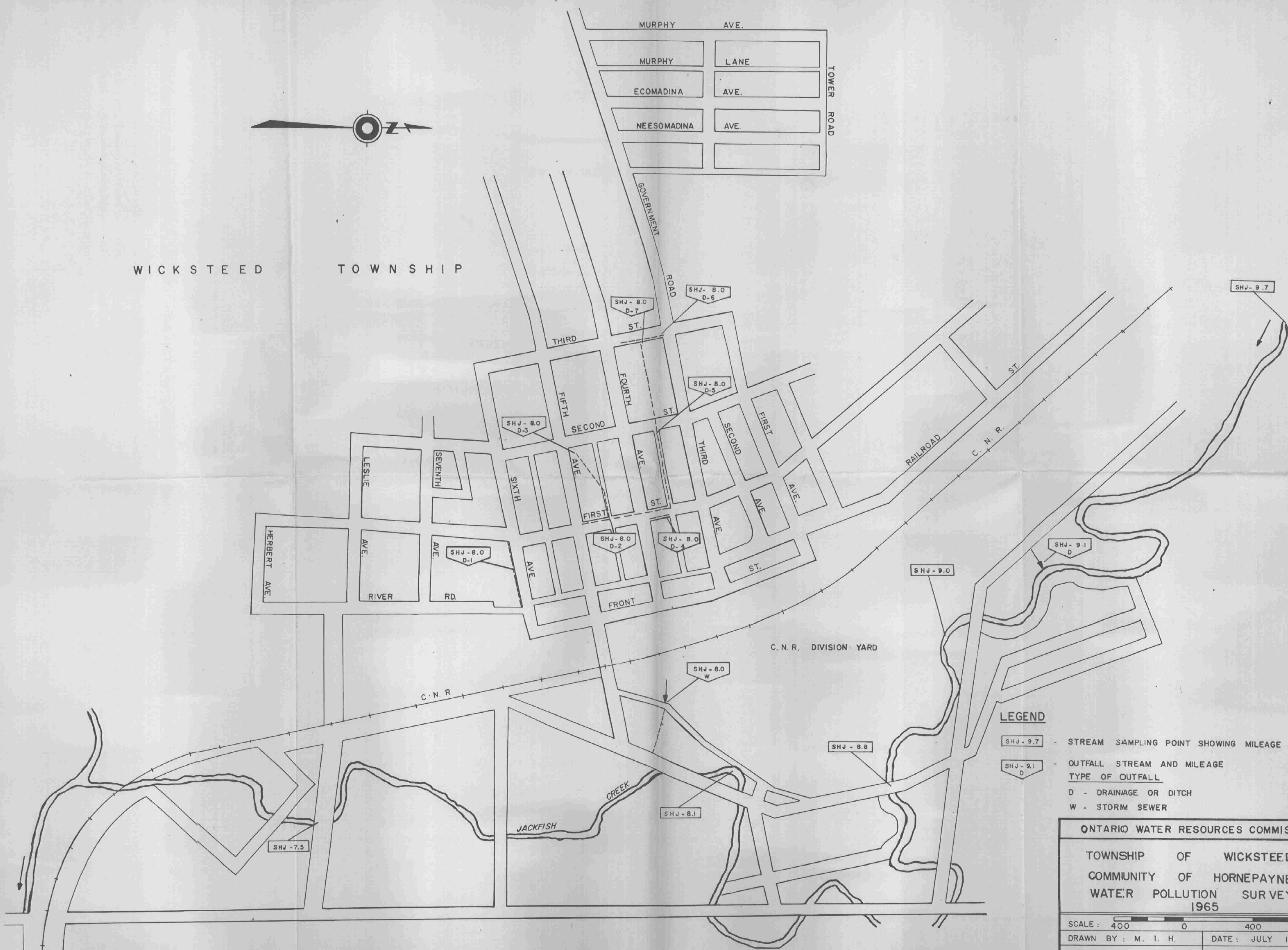
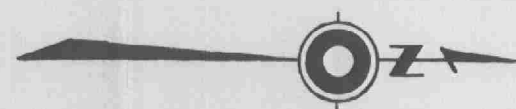
TABLE 2

JACKFISH CREEK

SAMPLING POINT No.	DESCRIPTION	DATE	5-DAY	TOTAL	SOLIDS		PHENOLS IN (PPB)	ETHER SOLUBLES (PPM)	TOTAL COLIFORM ORGANISMS/100 C.C.	MPN*	E. COLI
			BOD (PPM)		SUSP. (PPM)	DISS. (PPM)					PER 100 C.C.
SHJ-7.5	JACKFISH CREEK DOWN- STREAM FROM HORNEPAYNE.	SEPT. 15/65	1.8	166	6	160	0	2.4	210,000		24,000
SHJ-8.0 W	36-INCH DIAMETER CORRUGATED STORM SEWER EAST OF B.A. OIL COMPANY PROPERTY.	SEPT. 15/65	9.2	474	77	417			"		24,000,000
SHJ-8.1	JACKFISH CREEK UP- STREAM FROM STORM SEWER OUTFALL.	SEPT. 15/65	0.8	136	1	135	2	"	75,000		2,400
SHJ-8.8	JACKFISH CREEK AT Hwy. #631 BRIDGE.	SEPT. 15/65	1.0	140	3	137	0	7.6	4,300		240
SHJ-9.0	JACKFISH CREEK NORTH OF CNR DIESEL FUEL TANK.	SEPT. 15/65	1.3	134	1	133	2	4.0	460		240
SHJ-9.1 D	DRAINAGE DITCH FROM CNR YARD.	SEPT. 15/65	4.0	1292	484	808	2	8.8	9,300		0
SHJ-9.7	JACKFISH CREEK UP- STREAM FROM HORNEPAYNE.	SEPT. 15/65	0.8	162	2	160	2	2.0	75		0

* BACTERIOLOGICAL EXAMINATION PERFORMED AT THE ONTARIO DEPARTMENT OF HEALTH
REGIONAL LABORATORY, TIMMINS, ONTARIO.

WICKSTEED TOWNSHIP



LEGEND

- SHJ - 9.7 - STREAM SAMPLING POINT SHOWING MILEAGE
- SHJ - 9.1 D - OUTFALL STREAM AND MILEAGE
TYPE OF OUTFALL
- D - DRAINAGE OR DITCH
- W - STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

TOWNSHIP OF WICKSTEED,
COMMUNITY OF HORNEPAYNE
WATER POLLUTION SURVEY
1965

SCALE: 400	0	400	800 FT.
DRAWN BY: M. I. H.	DATE: JULY 1966		
CHECKED BY: R. W.	DRAWING NO: 66 - 47		